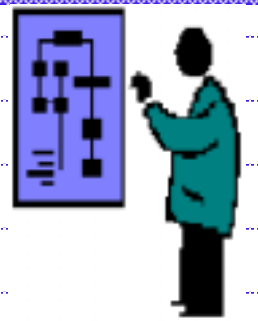
CLEANING AND PAINTING OF STRUCTURAL STEEL

PLANNING, DESIGN AND SPECIFICATIONS

FRANK D. REA

CHEMIST ADMINISTRATOR, FDOT

PROCESS



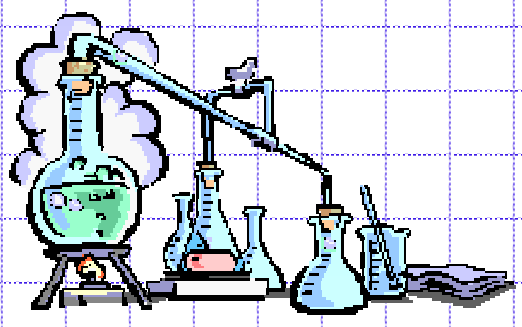
- USE BIANNUAL INSPECTION REPORTS TO CHOOSE STRUCTURES
- DETERMINE IF WHETHER HAZARDOUS NON-HAZARDOUS PAINT PROJECT
- PERFORM CONDITION ASSESSMENT
- WRITE SPECIFICATION

BIANNUAL INSPECTION REPORTS

- NEED MORE IN DEPTH INSPECTION
  - Good, Fair, Poor doesn't help
  - Digital Pictures

HAZARDOUS OR NON-HAZARDOUS?

- Records are good, but must be current
- When in doubt, sample in accordance with FM 5-564
- Send to State Materials Office for Analysis



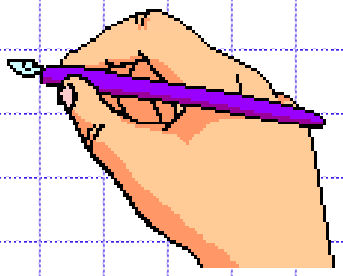
CONDITION ASSESSMENT

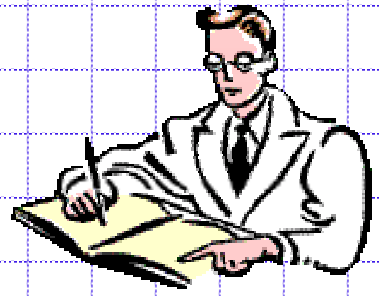
- CONDUCTED BY TRAINED INSPECTOR
- TESTS
  - Percent Visible Surface Rust (SSPC Vis-2)
  - Dry Film Thickness (DFT) of Existing Coating (SSPC PA-2)
  - Adhesion of Existing Coating (ASTM 3359)
  - Type of Existing Coating (especially topcoat)
- OTHER THINGS TO CONSIDER
  - Environment – Severity, Sensitivity
  - Traffic
  - Type of Structure (sharp edges, bolts)
  - Access

OVERCOATING

- OVERCOATING SHOULD BE CONSIDERED WHEN:
  - Structure will be removed within 8 years
  - Percent visible rusted surface Area is less than 18%
  - Total DFT is less than 20 mils
  - Adhesion rating is 4A or better
  - Generic type of topcoat susceptible to overcoating
    - Avoid “leaf” aluminum topcoats
    - Ensure topcoat is compatible with aluminum epoxy mastics or waterborne acrylics
    - Test Patch highly advisable

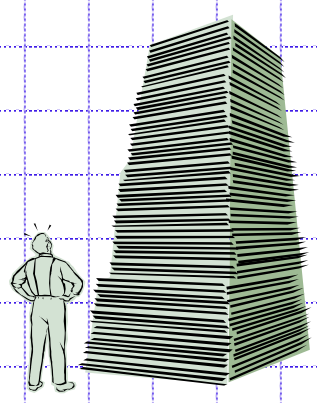
WRITING THE SPECIFICATION

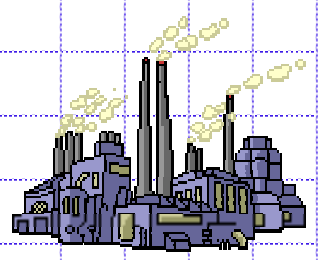




TECHNICAL SPECIAL PROVISION WHICH AMENDS SECTION(S) 560 AND/OR 561

- GENERAL NOTES
  - Chemistry Lab Results
  - If Hazardous, SSPC-QP2 Requirement





POLLUTION CONTROL

- REQUIRE COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS
- SPECIFY CONTAINMENT SYSTEM
- REQUIRE AND DEFINE REGULATED AREA
- AMBIENT AIR QUALITY COMPLIANCE
  - Do not exceed 150 µm/m^3 of fugitive respirable dust
  - Visible Emissions, EPA Method 22, <1% of workday
  - Air Monitoring
    - TSP – Total Suspended Particular (Lead)
      40 CFR 50, Appendix G, <1.5 µm/m^3 per 90 days
    - PM 10 – No longer necessary
- **SOIL TESTING (Pre and Post Project; EPA Methods 3050/6010)**

COLLECTING AND HANDLING OF WASTE

- REFERENCE SSPC GUIDE 7
- DESIGNATE RESPONSIBILITY
- REFERENCE 40 CFR 260-268 (RCRA)
- SAMPLE IN ACCORDANCE WITH EPA SW 846

COLLECTING AND HANDLING OF WASTE

- TEST FOR Pb, Cd, Cr; EPA METHOD 1311 (TCLP)
- TEST FOR Pb, Cd, Cr; EPA METHODS 3050/6010 IF STEEL ABRASIVE IS USED
- REFERENCE 40 CFR 261 FOR STORAGE OF WASTE
  - Waste cannot remain on site more than 90 days
- REFERENCE 40 CFR 263 FOR TRANSPORT OF WASTE

CLEANING AND PAINTING

- MAIN FACTORS
  - Service Environment
  - Amount of Lead in Existing Coating System
  - Overcoat or Full Removal?
  - Complexity of Structure
  - Access

CONSTRUCTION OR FULL REMOVAL OPTIONS

- 2,500 PSI WATER WASH THEN NEAR WHITE BLAST (SP-10)
- INORGANIC ZINC/ACRYLIC/ACRYLIC
  - Milder Environments
  - When Overspray is a Concern
- INORGANIC ZINC/EPOXY/POLYURETHANE
  - Severe Environments (Intercoastal Waterway)
- INORGANIC ZINC – UNTOPCOATED
  - When Aesthetics Aren't Important (Rural)
  - Can Topcoat Outside Face of Outside Beam (Interstate Overpasses)

NOTE: INORGANIC ZINC SHOULD ONLY BE USED FOR MAINTENANCE WHEN THE STRUCTURE IS OF RELATIVELY SIMPLE DESIGN. LIMITED NUMBER OF BOLTS AND SHARP EDGES.

FULL REMOVAL OPTIONS

- 2,500 psi WATER WASH THEN COMMERCIAL BLAST (SP-6)
- ALUMINUM EPOXY MASTIC/ACRYLIC/ACRYLIC
  - Milder Environments
  - When Overspray is a Concern
- ALUMINUM EPOXY MASTIC/POLYURETHANE
  - Severe Environments (Intercoastal Waterway)
- ALUMINUM EPOXY MASTIC (1 OR 2 COATS)
  - When Aesthetics Aren't Important (Rural)
  - Can Topcoat Outside Face of Outside Beam (Interstate Overpasses)

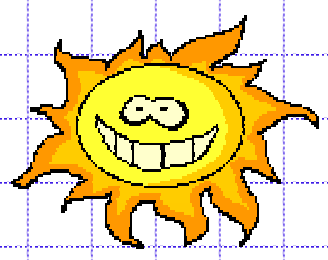
OVERCOAT OPTIONS

- 5,000 psi WATER WASH
- POWER TOOL CLEAN TO SP-3 OR SP-11 (VISIBLE RUST GRADE)
- SPOT PRIME WITH ALUMINUM EPOXY MASTIC
- THREE OPTIONS
  - AL EPOXY MASTIC/ACRYLIC/ACRYLIC
  - AL EPOXY MASTIC/POLYURETHANE
  - ACRYLIC/ACRYLIC

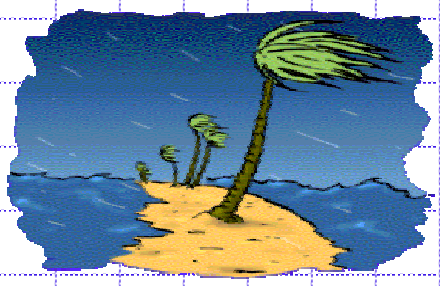
SPECIAL CASES

- MACHINERY AREAS
  - Do Not Use Water
  - Sponge Blast
  - Solvent Wipe then Hand or Power Tool Clean
  - Use Surface Tolerant Primer (Mastic)
- DECK GRATING AND BEARING ASSEMBLIES
  - Use Surface Tolerant Primer (Mastic)

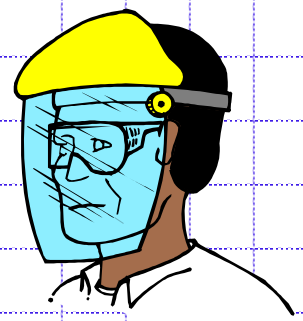
PAINTING CONDITIONS



- AMBIENT AIR TEMPERATURE (typically 50 to 90°F)
  - Acrylics – require minimum for 24 hours
- HUMIDITY (Usually <85%)
- DEW POINT (5 °F above)



WORKER SAFETY



- OSHA
- REQUIRE COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS
- 29 CFR 1926.62 “LEAD IN CONSTRUCTION

SUMMARY

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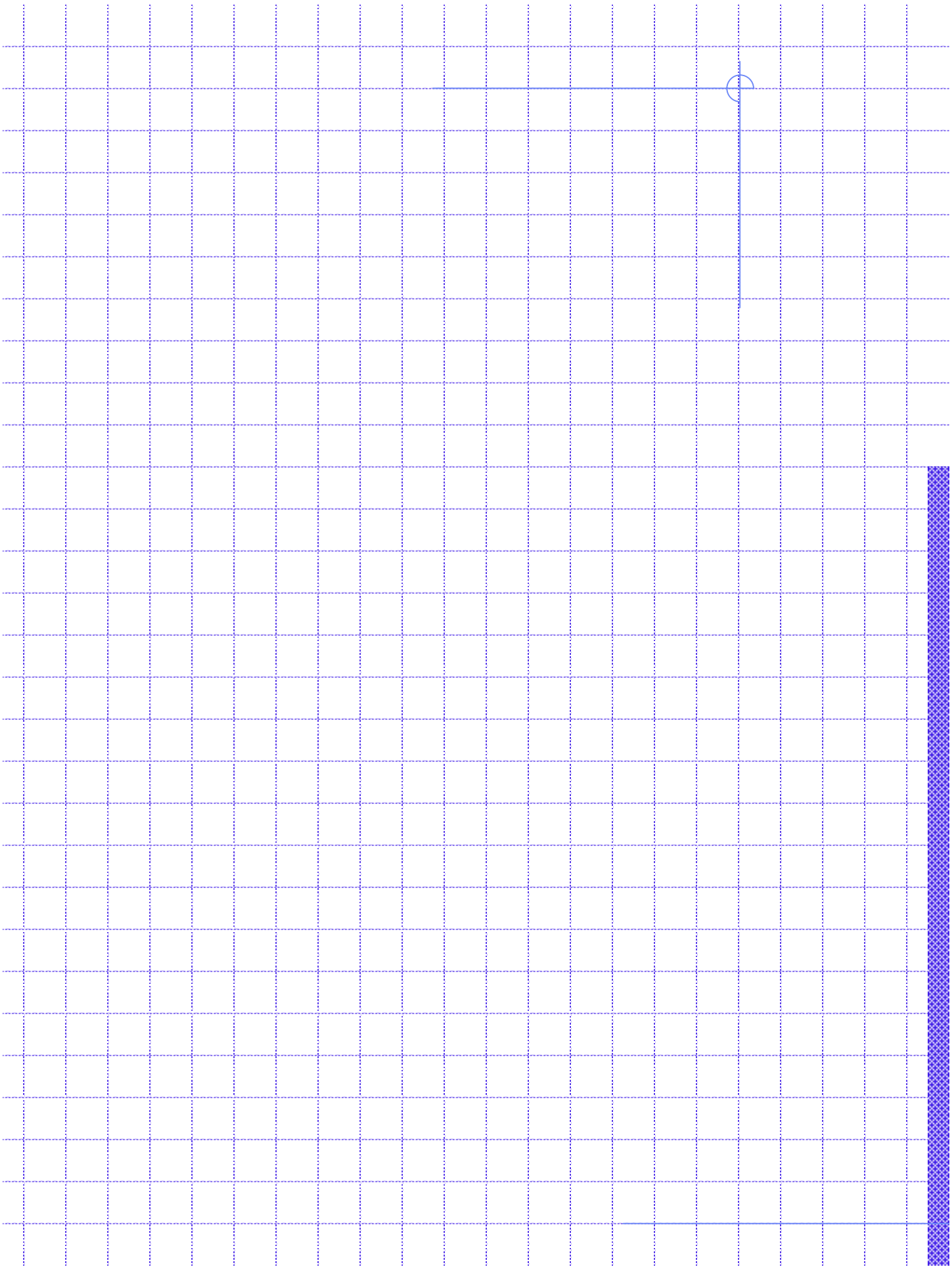
SUMMARY – WRITING THE TSP

- GENERAL NOTES
- POLLUTION CONTROL
- COLLECTION AND HANDLING OF WASTE
- CLEANING AND PAINTING
- PAINTING CONDITIONS
- WORKER SAFETY



TYPES OF CONTAINMENT
SSPC GUIDE 6

- ALWAYS SPECIFY AS MINIMUMS!
- WATER CLEANING CONTAINMENT (1W>2W>3W)
  - 3W lined with filter fabric - existing paint does not exceed RCRA TCLP limits
  - 1W - existing paint does exceeds RCRA TCLP limits
- POWER TOOL CLEANING CONTAINMENT (1P>2P>3P)
  - 3P - existing paint contains <0.01 % lead by weigh
  - 2P - existing paint contains 0.01 to 0.50 % lead by weight
  - 1P – existing paint contains >0.50 % lead by weight
- ABRASIVE BLAST CLEANING CONTAINMENT (1A>2A>3A>4A)
  - 3A - existing paint contains <0.01 % lead by weigh
  - 2A - existing paint contains 0.01 to 0.50 % lead by weight
  - 1A - existing paint contains >0.50 % lead by weight

return